

AMENDMENT TO THE CLAIMS

1. (Currently Amended) A method for building a down hole cutting tool, the cutting tool including a cutting element support structure having at least one cavity formed therein to support a cutting element, the method comprising:
inserting a base portion of the cutting element into the cavity;
locating a braze alloy such that when heated the braze alloy melts and fills a space in the cavity between the cutting element and the cutting element support structure, the braze alloy comprising silver in an amount of at least 40% by weight, copper in an amount of at least about 10% by weight, at least one selected from the group of zinc and tin, and about 0.5% to about 10% by weight of ~~at least one selected from the group of thallium (Tl) or thallium (Tl) and at least one selected from the group of gallium (Ga), and indium (In), and thallium (Tl)~~; and
heating the braze alloy such that it melts.
2. (Original) The method of claim 1, wherein the locating comprises placing the braze alloy in the cavity prior to the inserting of the cutting element.
3. (Original) The method of claim 1, wherein the locating comprises placing the braze alloy proximal the space between the cutting element and the cutting element support structure.
4. (Original) The method of claim 1, further comprising cooling the braze alloy such that it bonds the cutting element to the cutting element support structure.

5. (Original) The method of claim 1, wherein the tool comprises a tool body and the cutting element support structure comprises a blade that extends radially from the tool body.
6. (Original) The method of claim 1, wherein the down hole cutting tool comprises a drill bit.
7. (Original) The method of claim 6, wherein the drill bit comprises a fixed cutter bit.
8. (Original) The method of claim 7, wherein the fixed cutter drill bit further comprises a bit body and the cutting element support structure comprises a blade formed continuous with the bit body.
9. (Original) The method of claim 1, wherein the cutting element comprises a substrate having ultrahard material disposed thereon.
10. (Original) The method of claim 9, wherein the ultrahard material comprises polycrystalline diamond.
11. (Previously presented) The method of claim 1, wherein the braze alloy comprises both tin and zinc.
12. (Cancelled)
13. (Cancelled)
14. (Previously presented) The method of claim 1, wherein the braze alloy comprises zinc in an amount of at least about 6% by weight.
15. (Previously presented) The method of claim 1, wherein the braze alloy comprises tin in an amount of at least about 2% by weight.

16. (Currently Amended) The method of claim 1, wherein the braze alloy comprises between about 1% and about 8% of ~~at least one selected from the group of~~thallium (Tl) or thallium (Tl) and ~~at least one selected from the group of~~gallium (Ga) ~~and~~, indium (In), ~~and~~thallium (Tl).
17. (Currently Amended) The method of claim 1, wherein the braze alloy comprises between about 2% and about 5% of thallium (Tl) or thallium (Tl) ~~and~~ at least one selected from the group of gallium (Ga) ~~and~~, indium (In), ~~and~~thallium (Tl).
18. (Currently Amended) The method of claim 1, wherein the braze alloy comprises around 3% of thallium (Tl) or thallium (Tl) and at least one selected from the group of gallium (Ga) ~~and~~, indium (In), ~~and~~thallium (Tl), around 56% by weight silver, around 19% by weight copper, around 17% by weight zinc, and around 5% by weight tin.
19. (Cancelled)
20. (Cancelled)
21. (Currently Amended) A down hole cutting tool, comprising:
 - a cutting element support structure having at least one cavity formed therein;
 - a cutting element having a base portion disposed in the cavity;
 - a braze alloy disposed in the cavity between the cutting element and the cutting element support structure, the braze alloy comprising silver in an amount of at least 40% by weight, copper in an amount of at least about 10% by weight, at least one selected from the group of zinc and tin, and between about 0.5% and about 10% by weight of thallium (Tl) or thallium and ~~at least one selected from the group of~~gallium (Ga) ~~and~~, indium (In), ~~and~~thallium (Tl).

22. (Original) The tool of claim 21, further comprising a tool body, wherein the cutting element support structure is disposed on the tool body.
23. (Original) The tool of claim 22, wherein the cutting element supports structure comprises at least one radially extending blade integrally formed with the tool body, the blade having at least one cavity formed therein to support the cutting element.
24. (Original) The tool of claim 21, wherein the tool comprises a drill bit.
25. (Original) The tool of claim 24, wherein the drill bit is a fixed cutter drill bit.
26. (Original) The tool of claim 25, wherein the drill bit comprises a bit body and the cutting element support structure comprises a plurality of radially extending blades formed continuous with the bit body.
27. (Original) The tool of claim 24, wherein the bit comprises a bit body formed of at least one selected from steel and tungsten carbide infiltrated with an alloy binder.
28. (Original) The tool of claim 21, wherein the cutting element support structure is formed of at least one selected from the group of steel and tungsten carbide infiltrated with an alloy binder.
29. (Original) The tool of claim 21, wherein the cutting element comprises a substrate having ultrahard material disposed thereon.
30. (Original) The tool of claim 29, wherein the ultrahard material comprises polycrystalline diamond.
31. (Previously presented) The tool of claim 21, wherein the braze alloy comprises both tin and zinc.

32. (Cancelled)
33. (Cancelled)
34. (Previously presented) The tool of claim 21, wherein the braze alloy comprises zinc in an amount of at least about 6% by weight.
35. (Previously presented) The tool of claim 21, wherein the braze alloy comprises tin in an amount of at least about 2% by weight.
36. (Currently Amended) The tool of claim 21, wherein the braze alloy comprises between about 1% and about 8% of thallium (Tl) or thallium (Tl) and at least one selected from the group of gallium (Ga) and, indium (In), and thallium (Tl).
37. (Currently Amended) The tool of claim 21, wherein the braze alloy comprises between about 2% and about 5% of thallium (Tl) or thallium (Tl) and at least one selected from the group of gallium (Ga) and, indium (In), and thallium (Tl).
38. (Currently Amended) The tool of claim 21, wherein the braze alloy comprises around 3% of thallium (Tl) or thallium (Tl) and at least one selected from the group of gallium (Ga) and, indium (In), thallium (Tl); and the braze alloy further comprises around, 56% by weight silver, around 19% by weight copper, around 17% by weight zinc, and around 5% by weight tin.
39. (Cancelled)
40. (Cancelled)
41. (New) A down hole cutting tool, comprising:

a cutting element support structure having at least one cavity formed therein;

a cutting element having a base portion disposed in the cavity;

a braze alloy disposed in the cavity between the cutting element and the cutting element support structure, the braze alloy comprising silver in an amount of at least 40% by weight, copper in an amount of at least about 10% by weight, zinc in an amount of at least about 6% by weight, tin in an amount of at least about 5% by weight, and between about 2% to about 10% by weight of indium (In) or indium and at least one selected from the group of thallium (Tl) and gallium (Ga).

42. (New) The down hole cutting tool of claim 41, wherein the braze alloy comprises about 2% to about 5% by weight of indium (In) or indium and at least one selected from the group of thallium (Tl) and gallium (Ga).